

CLAIMS:

1. A method of artifact correction in a data set of an object of interest, the method comprising the step of: reconstructing an image of the object of interest on the basis of the data set; wherein a statistical weighing is performed during reconstruction of the image.
- 5 2. The method according to claim 1, wherein the data set is a projection data set acquired by means of a source of electromagnetic radiation generating a beam and by means of a radiation detector detecting the beam.
- 10 3. The method according to claim 2, wherein the source of electromagnetic radiation is a polychromatic x-ray source; wherein the source moves along a helical path around the object of interest; and wherein the beam has one of a cone beam geometry and a fan beam geometry.
- 15 4. The method according to claim 1, wherein the reconstruction of the image is performed on the basis of an iterative algorithm comprising a plurality of update steps until an end criterion has been fulfilled.
- 20 5. The method according to claim 4, wherein the iterative algorithm is a maximum likelihood algorithm; wherein the reconstructed image has the highest likelihood; and wherein the weighing is performed in each update step of the plurality of update steps.
- 25 6. The method according to claim 2, further comprising the step of: determining a number of detected photons during acquisition of the data set; wherein the weighing is based on a statistical error of the number of detected photons.

7. The method according to claim 5, further comprising the step of:
determining a number of detected photons Y_i during acquisition of the data set; wherein
the weighing is based on a statistical error σ_{Y_i} of the number of detected photons Y_i ;
- 5 wherein an update of an attenuation parameter μ_j^{n+1} is calculated from the attenuation
parameter μ_j^n by

$$\mu_j^{n+1} = \mu_j^n + \mu_j^n \frac{\sum_i l_{ij} \frac{\sum_i l_{ij} [d_i e^{-\langle l_i, \mu^n \rangle} - Y_i] / \sigma_{Y_i}^2}{\sum_i l_{ij} / \sigma_{Y_i}^2}}{\sum_i l_{ij} \langle l_i, \mu^n \rangle d_i e^{-\langle l_i, \mu^n \rangle}}$$

- 10 wherein d_i is a number of photons emitted by the source of radiation;
wherein l_{ij} is a basis function of an i -th projection;
wherein l_i is a vector of basis functions l_{ij} of the i -th projection; and
wherein $\langle l_i, \mu \rangle = \sum_j l_{ij} \mu_j$ is an inner product.

- 15 8. The method according to claim 2, wherein the reconstruction of the
image is based on a sub-set of at least two projections of all acquired projections of the
projection data set.

9. A data processing device, comprising: a memory for storing a data set of
20 an object of interest; a data processor for performing artifact correction in the data set
of the object of interest, wherein the data processor is adapted for performing the
following operation: loading the data set; reconstructing an image of the object of
interest on the basis of the data set; wherein a statistical weighing is performed during
reconstruction of the image.

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10. The data processing device according to claim 9, wherein the
reconstruction of the image is performed on the basis of an iterative algorithm
comprising a plurality of update steps until an end criterion has been fulfilled; wherein

the iterative algorithm is a maximum likelihood algorithm; wherein the reconstructed image has the highest likelihood; and wherein the weighing is performed in each update step of the plurality of update steps.

- 5 11. A CT scanner system, comprising: a memory for storing a data set of an object of interest; a data processor for performing artifact correction in the data set of the object of interest, wherein the data processor is adapted for performing the following operation: loading the data set; reconstructing an image of the object of interest on the basis of the data set; wherein a statistical weighing is performed during
10 reconstruction of the image.
12. A computer program for performing artifact correction in a data set of an object of interest, wherein the computer program causes a processor to perform the following operation when the computer program is executed on the processor: loading
15 the data set; reconstructing an image of the object of interest on the basis of the data set; wherein a statistical weighing is performed during reconstruction of the image.